

BASF Aktiengesellschaft

July 28, 2000

NAE19980848 **US** IB/UK/fey

We claim:-

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1. Apparatus for carrying out reactions involving a gaseous phase, a liquid phase and a solid phase, comprising

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- a dispersing element (6) for dispersing a gas phase in a liquid phase to generate a reaction fluid,

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- at least one reactor (1) which possesses an inlet (31, 41), an outlet (43) and a reactor space bounded by heat-removing walls which are spaced apart substantially uniformly along the main flow axis of the reaction fluid, and which is fitted with catalyst-coated metal fabric (20, 32), and

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- a feed line (7) which routes the reaction fluid from the dispersing element (6) to the reactor inlet (31, 41) and is sufficiently short that the degree of dispersion of the reaction fluid does not substantially change in the course of the passage through the feed line.

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2. Apparatus as claimed in claim 1, wherein the metal fabric (20, 32) is woven metal fabric.

3. Apparatus as claimed in claim 1, wherein the metal fabric (20, 32) is knitted metal fabric.

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4. Apparatus as claimed in claim 1, wherein the dispersing element (6) is a liquid jet gas compressor.

5. Apparatus as claimed in claim 1, wherein the reactor (1) is constructed as a heat exchanger.
6. Apparatus as claimed in claim 5, wherein the reactor (1) is constructed as a plate type heat exchanger.
7. Apparatus as claimed in claim 5, wherein the reactor (1) is constructed as a spiral type heat exchanger.
8. Apparatus as claimed in claim 5, wherein the walls in the reactor are spaced from 1 to 30 mm apart.
9. Apparatus as claimed in claim 5, wherein the walls in the reactor are spaced from 2 to 20 mm apart.
10. Apparatus as claimed in claim 5, wherein the walls in the reactor are spaced from 4 to 10 mm apart.
11. A process for carrying out reactions involving a gaseous phase, a liquid phase and a solid phase, which comprises the steps of
  - generating a reaction fluid by dispersing a gas phase in a liquid phase,
  - passing the generated reaction fluid through a reactor whose reactor space is equipped with woven or knitted metal fabrics coated with catalyst,
  - transferring the heat of reaction at the walls which bound the reactor space, and
  - separating the reaction fluid into gas phase and liquid phase.

12. A process as claimed in claim 11, operated with separate partial recycling of gas phase and/or liquid phase.

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13. A process as claimed in claim 11, wherein the superficial liquid velocity in the reactor is from 100 to 600  $\text{m}^3/(\text{m}^2 \cdot \text{h})$ .

- 10 14. A process as claimed in claim 11, wherein the superficial gas velocity is from 0.5 to 15 cm/s.

- 15 15. A process as claimed in claim 11, wherein the reaction fluid in the reactor is under a pressure of from 0.1 to 200 bar.

16. A process as claimed in claim 11, wherein the reaction fluid in the reactor has a temperature of from 25 to 250°C.

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